PATENT
File No.: 712-002-165/CC-0273

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Re application of: M. Davis et al.

Serial No.: 09/648,525 : Examiner: A. V. Amari

Filed: August 26, 2000 : Group Art Unit: 2872

For: OPTICAL FILTER HAVING A SHAPED FILTER FUNCTION

MAIL STOP APPEAL BRIEFS - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

RESPONSE TO NOTICE OF NON-COMPLIANCE

Sir:

This is a response to a Notification of Non-Compliant mailed 30 November 2005.[1]

Enclosed is a revised Brief being filed in **triplicate.** The fee in the amount of $500.00 in accordance with 37 CFR §1.17(c) was previously submitted with the original Brief for Appellants. The original brief was revised in view of the points raised in Form PTOL-462, including modifying the headings to conform with Part 41, incorporating reference numerals and references to Figures and pages in the specification in the Summary of the Invention section, and arguing each ground of rejection

[1] I hereby certify that this correspondence is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to the: MAIL STOP APPEAL BRIEFS - PATENTS, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Kelly A. Puglio
Kelly A. Puglio

1/30/2006
Date

separately.

Reconsideration and entry of the Revised Brief is earnestly requested.

Respectfully submitted,

William J. Barber
Attorney for Applicants
Registration No. 32,720

WJB/tp
January 27, 2006

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Alexandria, Virginia 22313-1450

REVISED BRIEF FOR APPELLANTS

Sir:

This is an appeal from an Official Action mailed March 17, 2005, made final.[1]

This Brief is being filed in **triplicate**. and the fee in the amount of $500.00 in accordance with 37 CFR §1.17(c) was previously submitted with the original Brief for Appellants.

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[1] I hereby certify that this correspondence is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to the: MAIL STOP APPEAL BRIEFS - PATENTS, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Kelly A. Puglio
Kelly A. Puglio

1/30/2006
Date

I. THE REAL PARTY IN INTEREST

The real party in interest is CiDRA Corporation, of Wallingford, Connecticut, a corporation of the State of Delaware, doing business at 50 Barnes Park North, Wallingford, CT 06492.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals and interferences.

III. STATUS OF CLAIMS

Claims 1 - 21, 32-37, 43-47, 49-54, 56, 58-68 and 70-72 are pending and stand rejected.

Claims 22-31, 39, 40, 42 and 70 are indicated to be allowed.

IV. STATUS OF AMENDMENTS

The last response submitted by Applicants was mailed December 29, 2004, which was entered.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The inventors have designed a new and unique optical filter 10 (Figure 1[2]), 200 (Figure 12[3]), 220 (Figure 13[4]), 250 (Figure 14[5]), 270 (Figure 15[6]) having a first optical element 16 (Figures 1, 12 and 13), 254 (Figure 14) and 272 (Figure 15) and a second optical element 18 (Figures 1, 12 and 13), 254 (Figure 14) and 272 (Figure 15). The first optical element is shown by way of example in Figures 10-11[7] and includes a first reflective element 40 (Figure 1) for receiving light and reflecting a first wavelength band of the light centered at a first reflection wavelength (λ_A), the first reflective element characterized by a first reflective filter function 47′ (Figure 3A), 47 (Figures 5-7). The second optical element is optically connected to the first optical element to receive the reflected first wavelength band of the light and includes a second reflective element 42 (Figure 1) for reflecting a second wavelength band of the light centered at a second reflection wavelength (λ_B), the second reflective element characterized by a second reflective filter

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[2] See pages 6-7.
[3] See the paragraph bridging pages 18-19.
[4] See the page 13, lines 11-28.
[5] See the paragraph bridging pages 19-20 and page 20, lines 14-20.

[6] See the paragraph bridging pages 20-21 and page 21, lines 8-21.

[7] See page 12, line 20, through page 16, line 25.

function 48′ (Figure 3B), 48 (Figures 5-7). The second optical element is similar to the first optical element shown by way of example in Figures 10-11.

The whole thrust of the claimed optical filter is characterized by the fact that at least one of the first reflective filter function 47′ (Figure 3A), 47 (Figures 5-9) and the second reflective filter function 48′ (Figure 3B), 48 (Figures 5-9) is not substantially flat over a substantial portion of the respective first or second reflective filter function, and the first wavelength band and the second wavelength band overlap spectrally as shown in Figures 3A, 3B, and 5-9, and as recited in claim 1.

Independent method claim 32 recites a method for filtering an input light having corresponding steps with substantially similar features, while independent claims 71 and 72 recite that at least one of the first and second reflective filter functions is not substantially constant, rectangular or square in shape over a substantial portion thereof.

One important advantage of this claimed optical filter and the method for filtering related to the same is that it can tune an optical input signal and produce a filtered optical output signal, where the tuning can result in the optical output signal having a desired effective filter function that is very difficult or substantially impossible to produce by a single grating, as

described in the patent application on page 9, lines 23-25. For example, Figures 5-7 show respective filter profiles for the first and second reflective filter functions, as well as output filter functions that would be very difficult or substantially impossible to produce by a single grating. In particular, Figures 5-7 show examples of combining Gaussian and ramp amplitude profiles to provide a desired signal having a combined Gaussian/ramp grating amplitude profile in Figure 5, or combining a Gaussian and rectangular amplitude profiles to provide a desired signal having a combined Gaussian/rectangular amplitude profile in Figures 6-7. The desired Gaussian/ramp and Gaussian/rectangular amplitude profiles have different amplitude profiles than either filter function profile of the two gratings used to provide the same. It is respectfully submitted that a person skilled in the art would appreciate that the combined Gaussian/ramp and Gaussian/rectangular amplitude profiles would be very difficult or substantially impossible to produce by a single grating.

Further, there is a need in the state of the art for an optical filter that can tune and/or condition an optical input signal into an optical output signal having such a desired effective filter function that is not substantially flat over a substantial portion thereof, and the claimed optical filter fills that need.

For all these reasons, the claimed optical filter provides an important contribution to the overall state of the art.

Finally, consistent with that described above, independent claim 58 recites an optical filter having a first reflective element for reflecting a first wavelength band of light centered at a first reflection wavelength, and a second reflective element for reflecting a second wavelength band of the light centered at a second reflection wavelength, whereby the first reflection wavelength and the second reflection wavelength are substantially the same. Figures 3A, 3B, 3C and 6 show the filter function profiles for this embodiment. This claimed optical filter also provides an important contribution to the overall state of the art for reasons consistent with that described above.

VI. GROUPS OF THE REJECTION TO BE REVIEWED ON APPEAL

The following issue will be addressed in the Argument:

Whether claims 1-6, 8-9, 11-12, 15, 32-34, 36, 43-45, 47, 58-62, 64, 66-68, 71 and 72 are obvious based on a proposed combination of Li (U.S. Patent 5,841,918) in view of Feced et al. (U.S. Patent 6,445,852).

Whether the remaining pending claims 7, 10, 13-14, 16-21, 35, 37, 46, 49-54, 56, 63 and 65 are obvious based on proposed combinations of Li in view of Feced et al. alone, or further in

view of either Kringlebotn (U.S. Patent No. 6,097,487) or Kewitsch (U.S. Patent No. 6,236,782) or Fernald et al. (U.S. Patent No. 6,229,827) or Putnam et al. (U.S. Patent No. 6,310,990), or some combination thereof.

VII. ARGUMENTS

In paragraphs 1-2 of the Office Action, claims 1-6, 8-9, 11-12, 15, 32-34, 36, 43-45, 47, 58-62, 64, 66-68, 71 and 72 are rejected as being obvious based on a proposed combination of Li (U.S. Patent 5,841,918) in view of Feced et al. (U.S. Patent 6,445,852).

The obviousness rejection is traversed for the reasons set forth below, which are substantially consistent with the remarks submitted in Applicants' December 29th response:

Claim 1

The obviousness rejection is respectfully traversed because neither Li, Feced et al. nor the proposed combination thereof teaches or suggests an optical filter featuring first and second optical elements having respective first and second reflective filter functions, wherein at least one of the first and second reflective filter functions is not substantially flat over a substantial portion of the respective first or second reflective filter functions, as recited in claim 1.

Consistent with that described above, one important advantage of this claimed optical filter is that it can tune an optical input signal and produce a filtered optical output signal, where the tuning can result in the optical output signal having a desired effective filter function that is very difficult or substantially impossible to produce by a single grating, as described in the patent application on page 9, lines 23-25. For example, Figures 5-7 show respective filter profiles for the first and second reflective filter functions, as well as output filter functions that would be very difficult or substantially impossible to produce by a single grating. In particular, Figures 5-7 show examples of combining Gaussian and ramp amplitude profiles to provide a desired signal having a combined Gaussian/ramp grating amplitude profile in Figure 5, or combining a Gaussian and rectangular amplitude profiles to provide a desired signal having a combined Gaussian/rectangular amplitude profile in Figures 6-7. The desired Gaussian/ramp and Gaussian/rectangular amplitude profiles have different amplitude profiles than either filter function profile of the two gratings used to provide the same. It is respectfully submitted that a person skilled in the art would appreciate that the combined Gaussian/ramp and Gaussian/rectangular amplitude profiles would be very difficult or substantially impossible to produce by a single grating.

Further, there is a need in the state of the art for an optical filter that can tune and/or condition an optical input signal into an optical output signal having such a desired effective filter function that is not substantially flat over a substantial portion thereof, and the claimed optical filter fills that need. For all these reasons, the claimed optical filter provides an important contribution to the overall state of the art.

In contrast to the claimed invention, Li discloses an optical system having a tuning element 18 with a reflection profile shown in Figure 2a, and a tuning element 20 with a transmission profile shown in Figure 2b, each having a respective amplitude profile. The combined reflection and transmission profiles result in a desired optical signal having a filter function shown in Figure 2c. In effect, Li's optical filter merely has two substantially flat filter functions, for providing an output signal having a corresponding substantially flat filter function. In operation, Li's filter can only tune or condition the optical input signal in relation to its bandwidth and/or wavelength using such substantially flat filter functions. Consistent with that shown in Figure 3, Li's optical system may be used as a demultiplexer receiving channels on waveguide 10 and passing or blocking the same to output 1, output 2, output 3 or output 4.

Moreover, Li does not hint or suggest to use at least one of the first and second reflective filter functions that is not substantially flat over a substantial portion of the first or second reflective filter functions, as recited in claim 1, especially in order to produce an optical output signal that is not substantially flat over a substantial portion thereof, which is the whole thrust of the claimed invention. Moreover still, nothing in Li suggests a reason to look beyond the teaching of Li itself as a whole to produce an optical output signal that is not substantially flat over a substantial portion thereof. For example, there is clearly no reason or motivation to use anything other than a flat filter function in the optical systems disclosed by Li.

The reasoning in paragraph 2 of the March 17th Office Action recognizes the deficiency in the teaching of Li and points to Feced et al. to make up for the same. However, while Feced et al. discloses an optical filter having a filter function that is not substantially flat over a substantial portion thereof, it is respectfully submitted that one of ordinary skill in the art would not be motivated to combine Feced et al.' "not substantially flat" filter with one of Li's "substantially flat" filter in the manner proposed in the last paragraph of page 6 of the March 17th Office Action. For example, nothing in Feced et al. suggests a reason to modify the teaching of Li as a whole to

produce an optical output signal that is not substantially flat over a substantial portion thereof. Moreover, it is respectfully submitted that neither Li nor Feced et al. suggests a need or desire "to provide for filter characteristics that are well-matched to ideal filter responses for a wide variety of applications," as stated in the reasoning on page 7, lines 1-4, of the March 17th Office Action, which appears to be the whole basis for making the proposed combination of these two cited prior art references.

For all these reasons, it is respectfully submitted that the proposed combination of Li in view of Feced et al. does not teach or suggest the claimed invention.

Response to Arguments Re Claim 1
on Pages 14-16 of the Final Rejection

In paragraph 10 of the March 17th Office Action (pages 14-16 thereof), the reasoning sets forth responses to arguments made by applicants in the communication mailed December 29, 2004. The following is a reply to the points raised therein.

1) In lines 3-12 of paragraph 10 of the March 17th Office Action, the reasoning remarks that applicants are "arguing features or limitations that are not recited in the claims."

However, in reply it is respectfully submitted that applicants' remarks are clearly directed towards "advantages" of the claimed optical filter, not features or limitations recited

in claim 1. Applicants clearly state above that:

> [O]ne important advantage of this claimed optical filter is that it can tune an optical input signal and produce a filtered optical output signal, where the tuning can result in the optical output signal having a desired effective filter function that is very difficult or substantially impossible to produce by a single grating, as described in the patent application on page 9, lines 23-25. For example, Figures 5-7 show respective filter profiles for the first and second reflective filter functions, as well as output filter functions that would be very difficult or substantially impossible to produce by a single grating. In particular, Figures 5-7 show examples of combining Gaussian and ramp amplitude profiles to provide a desired signal having a combined Gaussian/ramp grating amplitude profile in Figure 5, or combining a Gaussian and rectangular amplitude profiles to provide a desired signal having a combined Gaussian/rectangular amplitude profile in Figures 6-7. The desired Gaussian/ramp and Gaussian/rectangular amplitude profiles have different amplitude profiles than either filter function profile of the two gratings used to provide the same. It is respectfully submitted that a person skilled in the art would appreciate that the combined Gaussian/ramp and Gaussian/rectangular amplitude profiles would be very difficult or substantially impossible to produce by a single grating. [Underlining provided by the undersigned for emphasis.]

It is respectfully submitted that claim 1 clearly does not recite the limitation "a desired effective filter function that is very difficult or substantially impossible to produce by a single grating", and applicants do not even remotely suggest that it does. Instead, applicants clearly state that this "desired effective filter function" that results from the claimed optical filter provides an important advantage that distinguishes the performance of the claimed optical filter over other optical

filters known in the art.

Moreover, it is respectfully submitted that applicants clearly have the right to point out and argue "advantages" of the claimed invention over the prior art to support the position that the claimed invention is different and patentable over the same.

2) In lines 13-30 of paragraph 10 of the March 17th Office Action, the reasoning tries to further justify the basis for the proposed combination by taking the position that motivation to combine references "can be reasoned from knowledge that is known to one of ordinary skill in the art, established scientific principles or legal precedents established by prior case law."

However, in reply it is respectfully submitted that one of ordinary skill in the art would not be motivated to combine the cited prior art in the manner proposed based on any such so-called "reasoned from knowledge" motivation or for any other reason based on the evidence <u>on the record</u> for the following reasons:

Consistent with that discussed above, the whole thrust of <u>Li</u> is to provide a device for modifying the wavelength, bandwidth, or both of an optical signal. The modification can include a shift of the characteristic reflective spectrum or band, or an expansion or contraction of the spectrum. The device takes the form of multiple optical elements, each having substantially flat

filter functions. In operation, light is first reflected off one optical element filter having one substantially flat filter function, then further reflected off a second optical element filter having a second substantially flat filter function, so as to modify the light accordingly. There is no hint or suggestion whatsoever in Li to use any other type or kind of filter function other than a substantially flat one disclosed in Li. For instance, there is no hint or suggestion whatsoever in Li to use an optical element that is not substantially flat in place of either of Li's optical elements. Because of this, it is respectfully submitted that nothing on the record suggests why one of ordinary skill in the art would even be motivated to look at that disclosed by Feced et al. to make such a substitution and/or modification in a multiple optical element device like Li's optical system. It is also respectfully submitted that nothing in paragraph 10 of the March 17th Office Action suggests how or why such motivation is or "can be reasoned from knowledge that is known to one of ordinary skill in the art, established scientific principles or legal precedents established by prior case law" by one of ordinary skill in the art.

In spite of this, even for argument sake, if one of ordinary skill in the art were to look to Feced et al. to make such a substitution and/or modification in a multiple optical element device like Li's optical system, one would find no motivation to

make such a substitution and/or modification, because the whole thrust of Feced et al. is directed towards the design and implementation of an optical device or system having a single optical element with a single optical filter function. Nothing in Feced et al. even remotely suggests providing an optical filter having multiple optical elements with at least one of the first and second reflective filter functions that is not substantially flat over a substantial portion of the respective first or second reflective filter functions, as recited in claim 1, or the need or desire to do so. Because of this, even for argument sake, if one of ordinary skill in the art were to look to Feced et al., one would find no motivation to make such a substitution and/or modification to a multiple optical element device like Li's system. Finally, it is respectfully submitted that nothing in paragraph 10 of the March 17th Office Action suggests why such motivation is or "can be reasoned from knowledge that is known to one of ordinary skill in the art, established scientific principles or legal precedents established by prior case law" by one of ordinary skill in the art.

For these additional reasons, it is respectfully submitted that one of ordinary skill in the art would not be motivated to combine the cited prior art in the manner proposed based on any such so-called "reasoned from knowledge" or for any other reason based on the evidence on the record

Dependent Claims 2-6, 8-9, 11-12 and 15

Dependent claims 2-6, 8-9, 11-12 and 15 depend directly or indirectly from claim 1, contain all the limitations therein, and are deemed patentable for the reasons discussed above.

Claims 32 - 34 and 36

Independent claim 32 recites a method for filtering an input light having substantially similar limitations as claim 1. For reasons similar to that discussed above in relation to claims 1, it is respectfully submitted that independent claim 32 is deemed patentable over that disclosed in the proposed combination of Li in view of Feced et al.

Dependent claims 33-34, 36, 43-45 and 47 depend directly or indirectly from claim 32, contain all the limitations therein, and are deemed patentable for the reasons discussed above.

Claims 58 - 62, 64, and 66-68

Independent claim 58 recites an optical filter having a first reflective element for reflecting a first wavelength band of light centered at a first reflection wavelength, and a second reflective element for reflecting a second wavelength band of the light centered at a second reflection wavelength, whereby the first reflection wavelength and the second reflection wavelength

are substantially the same. Figures 3A, 3B, 3C and 6 show the filter function profiles for this embodiment.

Consistent with that discussed above, it is respectfully submitted that neither Li, Feced et al. nor the proposed combination thereof teaches or suggests an optical filter having first and second reflection wavelengths that are substantially the same, as recited in claim 58. For example, Li clearly does not use first and second reflection wavelengths that are substantially the same, while nothing in Feced et al. hints or suggests using two reflection wavelengths that are substantially the same, as recited in claim 58. Moreover, if Li's first and second reflection wavelengths were substantially the same, then there would be no tuning of the bandwidth, which is the whole purpose of the design of Li's optical system. In view of this, it is respectfully submitted that Li effectively teaches away from the optical filter recited in claim 58, in such a way that there is no reason or motivation to look beyond the teaching of Li itself as a whole or to make such a modification. For all these reasons, it is respectfully submitted that the proposed combination of Li in view of Feced et al. does not teach or suggest the claimed invention.

Response to Arguments Re Claim 58
on Page 16 of the Final Rejection

In paragraph 10 of the March 17th Office Action (page 16 thereof), the reasoning sets forth responses to arguments made by applicants in the communication mailed December 29, 2004. The following is a brief response to the points raised therein.

In lines 31-46 of paragraph 10 of the March 17th Office Action, the reasoning takes the position that "Li is read as teaching that the first reflection wavelength (Figure 2a) and the second reflection wavelength (Figure 2b) are substantially the same as that shown in Figure 2c."

However, in reply it is respectfully submitted that a person skilled in the art would appreciate that if Li's first and second reflection wavelengths were substantially the same, then there would be no tuning of the bandwidth, which is the whole purpose of the design of Li's optical system. In view of this, it is respectfully submitted that Li effectively teaches away from the optical filter recited in claim 58, in such a way that there is no reason or motivation to look beyond the teaching of Li itself as a whole or to make such a modification.

Dependent Claims 59-62, 64, and 66-68

Moreover, dependent claims 59-62, 64, and 66-68 depend directly or indirectly from claim 58, contain all the limitations therein, and are deemed patentable for the reasons discussed

above.

Claims 71-72

Independent claims 71-72 recites optical filters having similar limitations as claim 1. Claim 71 recites that at least one of the first or second reflective filter function is not substantially constant over a substantial portion thereof. For reasons similar to that discussed above in relation to claims 1, it is respectfully submitted that independent claims 71 and 72 are deemed patentable over that disclosed in the proposed combination of Li in view of Feced et al.

Arguments Regarding Remaining Dependent Claims

A. Claim 7:

In paragraph 3 of the Office Action, claim 7 is rejected based on proposed combinations of Li in view of Feced et al. and/or further in view of Kringlebotn (U.S. Patent No. 6,097,487).

Claim 7 depends indirectly from the aforementioned independent claim 1 and contains all the limitations therein.

It is respectfully submitted that Kringlebotn does not make up for the fundamental deficiency in that disclosed in Li in relation to that discussed above, or for the fundamental deficiency in basis for combining the cited prior art in the

manner proposed consistent with that discussed above.

For these reasons, it is respectfully that claim 7 is patentable over the cited prior art.

B. Claims 10, 35 and 63:

In paragraph 4 of the Office Action, claims 10, 35 and 63 are rejected based on proposed combinations of Li in view of Feced et al. and/or further in view of Kewitsch (U.S. Patent No. 6,236,782).

Claims 10, 35 and 63 depend directly or indirectly from the aforementioned independent claim 1 and contains all the limitations therein.

It is respectfully submitted that Kewitsch does not make up for the fundamental deficiency in that disclosed in Li in relation to that discussed above, or for the fundamental deficiency in basis for combining the cited prior art in the manner proposed consistent with that discussed above.

For these reasons, it is respectfully that claims 10, 35 and 63 are patentable over the cited prior art.

C. Claims 13, 14, 16-19, 37, 46, 49-51, 53-54, 56 and 65:

In paragraph 5 of the Office Action, claims 13, 14, 16-19, 37, 46, 49-51, 53-54, 56 and 65 are rejected based on proposed combinations of Li in view of Feced et al. and/or further in view

of Fernald et al. (U.S. Patent No. 6,229,827).

Claims 13, 14, 16-19, 37, 46, 49-51, 53-54, 56 and 65 depend directly or indirectly from the aforementioned independent claim 1 and contains all the limitations therein.

It is respectfully submitted that Fernald et al. does not make up for the fundamental deficiency in that disclosed in Li in relation to that discussed above, or for the fundamental deficiency in basis for combining the cited prior art in the manner proposed consistent with that discussed above.

For these reasons, it is respectfully that claims 13, 14, 16-19, 37, 46, 49, 50, 51, 53, 54, 56 and 65 are patentable over the cited prior art.

D. Claims 20-21:

In paragraph 6 of the Office Action, claims 20-21 are rejected based on proposed combinations of Li in view of Feced et al. and/or further in view of Putnam et al. (U.S. Patent No. 6,310,990).

Claims 20-21 depend directly or indirectly from the aforementioned independent claim 1 and contains all the limitations therein.

It is respectfully submitted that Putnam et al. does not make up for the fundamental deficiency in that disclosed in Li in relation to that discussed above, or for the fundamental

deficiency in basis for combining the cited prior art in the manner proposed consistent with that discussed above.

For these reasons, it is respectfully that claims 20-21 are patentable over the cited prior art.

E. Claim 52:

In paragraph 7 of the Office Action, claim 52 is rejected based on proposed combinations of Li in view of Feced et al. in view of Fernald et al. and further in view of Kewitsch.

Claim 52 depends indirectly from the aforementioned independent claim 1 and contains all the limitations therein.

It is respectfully submitted that Fernald et al. in view of Kewitsch does not make up for the fundamental deficiency in that disclosed in Li in relation to that discussed above, or for the fundamental deficiency in basis for combining the cited prior art in the manner proposed consistent with that discussed above.

For these reasons, it is respectfully that claim 52 is patentable over the cited prior art.

ALLOWABLE SUBJECT MATTER

Claims 22-31, 39, 40, 42 and 70 are indicated to be allowed.

Conclusion

In view of this, it is respectfully submitted that the reasoning in the rejection of these claims is in error, and should be reversed.

Respectfully submitted,

William J. Barber
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Registration No. 32,720

WJB/tp
January 27, 2006

VIII. APPENDIX

The following claims are pending in the patent application:

1. (Previously presented) An optical filter comprising:

a first optical element including a first reflective element for receiving light and reflecting a first wavelength band of the light centered at a first reflection wavelength, the first reflective element characterized by a first reflective filter function; and

a second optical element, optically connected to the first optical element to receive the reflected first wavelength band of the light, including a second reflective element for reflecting a second wavelength band of the light centered at a second reflection wavelength, the second reflective element characterized by a second reflective filter function, whereby at least one of the first reflective filter function and the second reflective filter function is not substantially flat over a substantial portion of the respective first or second reflective filter function, and the first wavelength band and the second wavelength band overlap spectrally.

2. (Previously amended) The optical filter of claim 1, wherein one of the first and second optical elements is tunable to change the corresponding first or second reflection wavelength.

3. (Previously presented) The optical filter of claim 1, wherein both of the first and second optical elements is tunable to change each of the respective first and second wavelengths.

4. (Original) The optical filter of claim 1, further comprising:

an optical directing device optically connected to the first and second optical elements; the optical directing device directing the light to the first reflective element, directing the first wavelength band reflected from the first reflective element to the second reflective element, and directing the second wavelength band reflected from the second reflective element to the output port of the optical directing device.

5. (Original) The optical filter of claim 4, wherein the optical directing device comprises at least one circulator.

6. (Original) The optical filter of claim 5 wherein the circulator receives the light at a first port of the circulator, directs the light to the first reflective element through a second port of the circulator, receives the first wavelength band at the second port, directs the first wavelength band to the second reflective element through a third port of the circulator, receives the second wavelength band at the third port, and directs the second wavelength band to a fourth port of the circulator.

7. (Original) The optical filter of claim 4 wherein said optical directing device comprises an optical coupler.

8. (Original) The optical filter of claim 1, wherein the first reflection wavelength and the second reflection wavelength are substantially aligned to reflect a portion of the aligned wavelength bands to an output port.

9. (Previously presented) The optical filter of claim 1, wherein one of the first and second reflective filter functions comprises one of a Gaussian, rectangular and ramp shape.

10. (Original) The optical filter of claim 1, wherein one of the first and second reflective elements is fully apodized and the other of the first and second reflective elements is partially apodized.

11. (Original) The optical filter of claim 1, wherein the first reflection wavelength is offset a predetermined spacing from the second reflection wavelength.

12. (Previously Presented) The optical filter of claim 1, wherein at least one of the first and second optical elements have an outer cladding and an inner core disposed therein, wherein the at least one of the first and second reflective element comprises a grating disposed in a longitudinal direction of the inner core.

13. (Original) The optical filter of claim 12, wherein the at least one of the first and second optical elements comprises:

an optical fiber, having a reflective element written therein; and

a tube, having the optical fiber and the reflective element encased therein along a longitudinal axis of the tube, the tube being fused to at least a portion of the fiber.

14. (Previously presented) The optical filter of claim 12, wherein the at least one of the first and second optical elements is an optical waveguide having an outer transverse dimension of at least 0.3 mm.

15. (Original) The optical filter of claim 12, wherein the at least one of the first and second optical elements is an optical fiber.

16. (Previously presented) The optical filter of claim 2 further includes a compression device that axially compresses at least one of the first and second optical elements, wherein at least one of the respective first and second reflective elements is disposed along an axial direction of the respective first and second optical elements.

17. (Previously presented) The optical filter of claim 3 further comprising:

a first compressing device for compressing axially the first element to tune the first reflective element, wherein the first reflective element is written in the longitudinal direction in the first optical element; and

a second compressing device for compressing axially the second optical element to tune the second reflective element, wherein the second reflective element is written in the direction in the second optical element.

18. (Original) The optical filter of claim 1 further includes a straining device for tensioning axially the first optical element to tune the first reflective element, wherein the first reflective element is disposed along an axial direction of the first optical element.

19. (Original) The optical filter of claim 1 further includes a heating element for varying the temperature of the first optical element to tune the first reflective element to reflect the selected first wavelength band.

20. (Previously presented) The optical filter of claim 2 further includes:

a first compressing device for axially compressing at least the first optical element to tune the first reflective element, responsive to a displacement signal, wherein the first reflective element is disposed axially along the first optical element; and

a displacement sensor, responsive to the compression of the first optical element, for providing the displacement signal indicative of the change in the displacement of the first optical element.

21. (Previously presented) The optical filter of claim 20, wherein the displacement sensor includes a capacitance sensor coupled to the first optical element for measuring the change in the capacitance that depends on the change in the displacement of the first optical element.

22. (Previously presented) A tunable optical filter comprising:

a tunable optical waveguide for receiving light, the tunable optical waveguide comprising:

a first inner core having a first reflective element disposed therein, the first reflective element receiving the light and reflecting a first wavelength band of the light centered at a first reflection wavelength, the first reflective element characterized by a first reflective filter function; and

a second inner core having a second reflective element disposed therein, the second inner core being optically connected to the first inner core to receive the reflected first wavelength band of the light, the second reflective element reflecting a second wavelength band of the light centered at a second reflection wavelength, the second reflective element characterized by a second reflective filter function.

23. (Previously presented) The optical filter in claim 22, wherein the first and second reflective elements include a respective Bragg grating.

24. (Previously presented) The optical filter of claim 22, wherein the tunable optical waveguide has an outer transverse dimension of at least 0.3 mm.

25. (Previously presented) The optical filter of claim 22, further comprising:

an optical directing device optically connected to the first and second inner cores; the optical directing device directing the light to the first reflective element, directing the first wavelength band reflected from the first reflective element to the second reflective element.

26. (Original) The optical filter of claim 25, wherein the optical directing device comprises at least one circulator.

27. (Previously presented) The optical filter in claim 22, further includes a compressing device for axially compressing the tunable optical waveguide to tune the first and second reflective elements.

28. (Original) The optical filter of claim 22, wherein the first and second reflection wavelengths are substantially aligned.

29. (Previously presented) The optical filter of claim 22, wherein at least one of the first reflective filter function and the second reflective filter function is not substantially flat over a substantial portion of the respective first or second reflective filter function, and the first wavelength band and the second wavelength band overlap spectrally.

30. (Previously presented) The optical filter of claim 70, wherein the first and second reflection wavelengths are offset by a predetermined spacing.

31. (Previously presented) The optical filter of claim 22 further includes:

a compressing device for axially compressing the tunable optical waveguide to tune the first and second reflective elements, responsive to a displacement signal, wherein the first and second reflective elements are disposed axially along the tunable optical waveguide; and

a displacement sensor, responsive to the compression of the tunable optical waveguide, for providing the displacement signal indicative of the change in the displacement of the tunable optical waveguide.

32. (Previously presented) A method for filtering an input light; the method comprising:

providing a first optical element including a first reflective element for receiving the input light and reflecting a first wavelength band of the light centered at a first reflection wavelength, the first reflective element characterized by a first reflective filter function;

providing a second optical element, optically connected to the first optical element to receive the reflected first wavelength band of the light, including a second reflective element for reflecting a second wavelength band of light centered at a second reflection wavelength, the second reflective element characterized by a second reflective filter function, whereby at least one of the first reflective filter function and the second reflective filter function is not substantially flat over a substantial portion of the respective first or second reflective filter function; and

tuning one of the first and second reflective elements to overlap spectrally the first wavelength band and the second wavelength band.

33. (Original) The method of claim 32 wherein the tuning one of the first and second reflective elements includes compressing the one of the first and second optical elements.

34. (Previously presented) The method of claim 32, wherein the tuning one of the first and second reflective elements comprises:

substantially aligning the first reflection wavelength and the second reflection wavelength.

35. (Original) The method of claim 32, wherein one of the first and second reflective elements is fully apodized and the other of the first and second reflective elements is partially apodized.

36. (Previously presented) The method of claim 32, wherein the tuning one of the first and second reflective elements comprises:

offsetting the first reflection wavelength and the second reflection wavelength by a predetermined spacing.

37. (Previously presented) The optical filter of claim 1, wherein the at least one of the first and second optical waveguides has outer dimensions along perpendicular axial and transverse directions, a first portion of the at least one of the first and second optical waveguides having an outer dimension being at least 0.3 mm along said transverse direction, at least a

portion of the first portion having a transverse cross-section which is continuous and comprises a substantially homogeneous material; and the at least one of the first and second optical waveguides being axially strain compressed so as to change the at least one of the first and second reflection wavelengths.

Claim 38 (Cancelled).

39. (Previously presented) The optical filter of claim 29, wherein one of the first and second reflective filter functions comprises one of a Gaussian, rectangular and ramp shape.

40. (Previously presented) The optical filter of claim 29, wherein one of the first and second reflective elements is fully apodized and the other of the first and second reflective elements is partially apodized.

Claim 41 (Cancelled).

42. (Previously presented) The optical filter of claim 29, wherein the shape of the first reflective filter function is different than the shape of the second reflective filter function.

43. (Previously presented) The method of claim 32, further comprising tuning the other one of the first and second reflective elements to overlap spectrally the first wavelength band and the second wavelength band.

44. (Previously presented) The method of claim 32, wherein one of the first and second reflective filter functions comprises one of a Gaussian, rectangular and ramp shape.

45. (Previously presented) The method of claim 32, wherein at least one of the first and second optical elements comprises an optical waveguide having an outer cladding and an inner core disposed therein, wherein the at least one of the first and second reflective element comprises a grating disposed in a longitudinal direction of the inner core.

46. (Previously presented) The method of claim 45, wherein the at least one of the first and second optical elements is an optical waveguide having an outer transverse dimension of at least 0.3 mm.

47. (Previously presented) The method of claim 45, wherein the at least one of the first and second optical elements is an optical fiber.

Claim 48 (Cancelled).

49. (Previously presented) The optical filter of claim 37, wherein both of the first and second optical waveguides is tunable to change each of the respective first and second reflection wavelengths.

50. (Previously presented) The optical filter of claim 37, wherein the first reflection wavelength and the second reflection wavelength are substantially aligned to reflect a portion of the aligned wavelength bands to an output port.

51. (Previously presented) The optical filter of claim 37, wherein one of the first and second filter functions comprises one of a Gaussian, rectangular and ramp shape.

52. (Previously presented) The optical filter of claim 37, wherein one of the first and second reflective elements is fully apodized and the other of the first and second reflective elements is partially apodized.

53. (Previously presented) The optical filter of claim 37, wherein the first reflection wavelength is offset a predetermined spacing from the second reflection wavelength.

54. (Previously presented) The optical filter of claim 37, wherein at least one of the first and second reflective elements includes a Bragg grating.

Claim 55 (Cancelled).

56. (Previously presented) The optical filter of claim 37 further includes a compression device that axially compresses at least one of the first and second optical waveguides, wherein at least one of the respective first and second reflective elements is disposed along an axial direction of the respective first and second tunable elements.

Claim 57 (Cancelled).

58. (Previously presented) An optical filter comprising:

a first optical waveguide including a first reflective element for receiving light and reflecting a first wavelength band of the light centered at a first reflection wavelength, the first reflective element characterized by a first reflective filter function; and

a second optical waveguide, optically connected to the first optical waveguide to receive the reflected first wavelength band of the light, including a second reflective element for reflecting a second wavelength band of the light centered at a second reflection wavelength, the second reflective element characterized by a second reflective filter function;

whereby the first reflection wavelength and the second reflection wavelength are substantially the same.

59. (Previously presented) The optical filter of claim 58, wherein one of the first and second optical waveguides is tunable to change the corresponding first or second reflection wavelength, and maintain substantial alignment of the first and second reflection wavelengths.

60. (Previously presented) The optical filter of claim 58, wherein both of the first and second optical waveguides is tunable to change each of the respective first and second reflection wavelengths, and maintain substantial alignment of the first and second reflection wavelengths.

61. (Previously presented) The optical filter of claim 58, further comprising:

an optical directing device optically coupled to the first and second optical waveguides; the optical directing device directing the light to the first reflective element, directing the first wavelength band reflected from the first reflective element to the second reflective element.

62. (Previously presented) The optical filter of claim 58, wherein one of the first and second reflective filter functions comprises one of a Gaussian, rectangular and ramp shape.

63. (Previously presented) The optical filter of claim 58, wherein one of the first and second reflective elements is fully apodized and the other of the first and second reflective elements is partially apodized.

64. (Previously presented) The optical filter of claim 58, wherein at least one of the first and second reflective elements includes a Bragg grating.

65. (Previously presented) The optical filter of claim 64, wherein a portion of the at least one of the first and second optical waveguides has an outer transverse dimension of at least 0.3 mm.

66. (Previously presented) The optical filter of claim 64, wherein the at least one of the first and second optical waveguides is an optical fiber.

67. (Previously presented) The optical filter of claim 59 further includes a compression device that axially compresses at least one of the first and second tunable optical waveguides, wherein at least one of the respective first and second reflective elements is disposed along an axial direction of the respective first and second optical waveguides.

68. (Previously presented) The optical filter of claim 58, wherein the shape of the first reflective filter function is different than the shape of the second reflective filter function.

Claim 69 (Cancelled).

70. (Previously presented) The optical filter of claim 22, wherein the first wavelength band and the second wavelength band overlap spectrally.

71. (Previously presented) An optical filter comprising:

a first optical element including a first reflective element for receiving light and reflecting a first wavelength band of the light centered at a first reflection wavelength, the first reflective element characterized by a first reflective filter function; and

a second optical element, optically connected to the first optical element to receive the reflected first wavelength band of the light, including a second reflective element for reflecting a second wavelength band of the light centered at a second reflection wavelength, the second reflective element characterized by a second reflective filter function, whereby at least one of the first reflective filter function and the second reflective filter function is not substantially constant over a substantial portion of the respective first or second reflective filter function, and the first wavelength band and the second wavelength band overlap spectrally.

72. (Previously presented) An optical filter comprising:

a first optical element including a first reflective element for receiving light and reflecting a first wavelength band of the light centered at a first reflection wavelength, the first reflective element characterized by a first reflective filter function; and

a second optical element, optically connected to the first optical element to receive the reflected first wavelength band of the light, including a second reflective element for reflecting a second wavelength band of the light centered at a second reflection wavelength, the second reflective element characterized by a second reflective filter function, whereby at least one of the first reflective filter function and the second reflective filter function is not substantially rectangular or square in shape, and the first wavelength band and the second wavelength band overlap spectrally.